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ASSISTANT COMMISSIONER FOR PATENTS
PO BOX 1450
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Re: Serial No.: 09/830,477
Applicant(s): GILBERT MOINEAU, ET AL.
Filing Date: OCTOBER 23, 2001
For: DNS RELAY MODULE IN A DIGITAL NETWORK MODEM
Group Art Unit: 2155
Examiner: KEVIN T. BATES

SIR:

Attached hereto for filing are the following papers:

REQUEST FOR PRIORITY
CERTIFIED CANADIAN PATENT NO. 2,252,207

Our check in the amount of $ -0- is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary extension of time to make the filing of the attached documents timely, please charge or credit the difference to Deposit Account No. 50-1442. Further, if these papers are not considered timely filed, then a request is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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Steven B. Kelber
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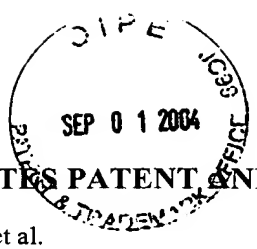
DOCKET NO.: SWA-003-US



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Gilbert MOINEAU, et al. ART UNIT: 2155

SERIAL NO: 09/830,477 EXAMINER: Kevin T. Bates

FILED: October 23, 2001

FOR: DNS RELAY MODULE IN A DIGITAL NETWORK MODEM

REQUEST FOR PRIORITY

ASSISTANT COMMISSIONER FOR PATENTS
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SIR:

☐ Full benefit of the filing date of U.S. Application Serial Number [US App No], filed [US App Dt], is claimed pursuant to the provisions of **35 U.S.C. §120.**

☐ Full benefit of the filing date of U.S. Provisional Application Serial Number , filed , is claimed pursuant to the provisions of **35 U.S.C. §119(e).**

■ Applicants claim any right to priority from any earlier filed applications to which they may be entitled pursuant to the provisions of **35 U.S.C. §119**, as noted below.

In the matter of the above-identified application for patent, notice is hereby given that the applicants claim as priority:

COUNTRY	APPLICATION NUMBER	MONTH/DAY/YEAR
Canada	2,252,207	October 30, 1998

Certified copies of the corresponding Convention Application(s)

■ are submitted herewith

☐ will be submitted prior to payment of the Final Fee

☐ were filed in prior application Serial No. filed

☐ were submitted to the International Bureau in PCT Application Number

☐ (A) Application Serial No.(s) were filed in prior application Serial No. filed ; and

(B) Application Serial No.(s)

- ☐ are submitted herewith
- ☐ will be submitted prior to payment of the Final Fee

Respectfully submitted,

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Certification

Canadian Patent Office

Certification

La présente atteste que les documents ci-joints, dont la liste figure ci-dessous, sont des copies authentiques des documents déposés au Bureau des brevets.

This is to certify that the documents attached hereto and identified below are true copies of the documents on file in the Patent Office.

Specification and Drawing, as originally filed, with Application for Patent Serial No: **2,252,207**, on October 30, 1998, by **EICON TECHNOLOGY CORPORATION**, for "Digital Network Modem and Configuration System for a Digital Network Modem".

Agent certificateur/Certifying Officer

August 5, 2004

Date

Canada

(CIPO 68)
31-03-04

OPIC CIPO

DIGITAL NETWORK MODEM AND CONFIGURATION SYSTEM FOR A DIGITAL NETWORK MODEM

Objects of the Invention

It is a first object of the invention to provide in a digital network modem (i.e. a router or gateway device) a mechanism for dynamically assigning network addresses on a LAN, such as DHCP, which mechanism has an autosense feature to automatically shut itself off when the modem detects that a similar device is present on the LAN.

It is a second object of the invention to provide in a digital network modem a mechanism for initializing a static IP address for the modem on the LAN via communication with a configuration station on the LAN.

It is a third object of the invention to provide in a digital network modem a domain name server (DNS) relay module for acting as a DNS for all domain name requests from the LAN. More specifically, it is an object to provide such a DNS relay module that provides a rapid response to domain name requests from a local store, while other domain name requests are passed on to an external DNS in a manner transparent to the LAN clients. It is equally an object to provide such a DNS relay module that manages the sending of requests to more than one external DNS's in a manner transparent to the LAN clients to provide better efficiency. It is furthermore an object to provide such a DNS relay module that responds to requests to certain domain names according to predetermined criteria, such as security requirements and access privileges.

Brief Description of the Drawings

The invention will be better understood by way of the following detailed description of a preferred embodiment with reference to the appended drawings, in which:

Fig. 1 is a schematic block diagram of the LAN ISDN modem according to the preferred embodiment connected to a LAN to which a configuration station and a network DHCP server are also connected.

Detailed Description of the Preferred Embodiment

As illustrated in Fig. 1, the digital modem 10 according to the preferred embodiment is an ISDN modem having a plurality of functional components shown in Fig. 1. The separation of components illustrated in the separate blocks in Fig. 1 is for the purposes of illustration only, and does not necessarily reflect the physical separation of components in the real device which is built from both hardware and software/firmware components.

When the modem 10 is connected to the Ethernet local area network (LAN) 22 and powered up, a LAN interface 12 and a modem address initializer unit 14 become active. The initializer unit 14 broadcasts a message on LAN 22 to detect whether a Dynamic Host Configuration Protocol (DHCP) server 28 is present on the LAN 22. If a response is received from the server 28, initializer 14 sends a disable signal to the modem's own DHCP server 16. If no response is received, the DHCP server 16 is not disabled, and it will be able to operate as a DHCP server on network 22 once a network address for modem 10 is assigned. When modem 10 functions as a DHCP server, DHCP server 16 will reply to DHCP discover packets broadcasted by clients 30 and 32 (and possibly station 24) to configure their IP addresses.

In accordance with the present invention, the modem 10 may be installed in the network environment by assigning it an address either by direct connection or via the network. The address initializer module 14 provided in modem 10

communicates both with LAN interface 12 and a serial port in communication with a console 15. The console 15 may be provided by a PC running a terminal program. In the prior art, the network IP address for the modem was communicated to the modem by using a console connected to the modem by a serial port, and thus the IP address for the modem was not set through the network (it is also known in the art to allow the IP address to be set in the factory, by keyboard input or by DIP switches)., In the preferred embodiment, the modem 10 must have a static IP address (i.e. a dynamic address from either DHCP server 28 or 16 is not to be used), and configuration station 24 is used in configuring the IP address for the modem 10 via the LAN 22. The configuration station 24 may have a static IP address or it may be a DHCP client and have a dynamic IP address. A system tray or modem monitor program 26 in the configuration station is used to assign modem 10 its static IP address.

In the preferred embodiment, modem 10 may communicate with configuration station 24 either using HTML pages and an IP connection, or using menus with a terminal connection via LAN 22 or console 15.

To communicate with modem 10 initially, the system tray 26 discovers the modem 10 by sending a broadcast packet on port 1440. If modem 10 and the configuration station 24 are not on the same sub-net, the system tray 26 can ask modem 10 to change its address to be on the same sub-net. The system tray thus sends a proprietary discovery user datagram protocol (UDP) broadcast message to a predetermined port, namely to address FF.FF.FF.FF:1440, which address is detected by initializer 14. In response, initializer 14 sends a reply broadcast message to port 1440, namely to address FF.FF.FF.FF:1440, and the modem 10 includes its MAC address in the packet. The system tray 26 then sends a broadcast packet to port 1440 including in the packet the MAC address of modem 10 along with the static IP address to be used. Initializer 14 recognizes its own MAC address in the packet broadcast from the system tray 26 and sets the IP address for the modem 10 to the address contained in the

packet. If station 24 is a DHCP client and get its address from DHCP Server 16, there is no need to change the MODEM IP address. The modem confirms the validity of its chosen address by sending onto LAN 22 a ping message to the same address, if a response is received, then modem 10 does not confirm its address and requests a new address, otherwise the address is confirmed, and the modem is operational.

In selecting the IP address for modem 10, the configuration station is equipped with software, namely utility programs called Wizards, to help the user of station 24 install modem 10 by finding an available address for modem 10 on network 22. Such programs provide a list of all used static addresses, as well as the range of addresses reserved for dynamic allocation. The address for modem 10 must also be identified as a gateway or router and, in the preferred embodiment, as a domain name server (DNS) since modem 10 includes a DNS relay module 19.

While in the preferred embodiment modem 10 uses a static IP address for simplifying administration, it would be possible to allow modem 10 to use a dynamic address, either one allocated by server 28 or by its own DHCP server 16. In this case, the system tray 26 is not required to assign an address to modem 10, and configuration station 24 may be used to set control parameters in modem 10.

Modem 10 acts as a router or gateway to a remote network via, in the preferred embodiment, an ISDN connection 20. In the preferred embodiment, one channel of the ISDN line is connected to an Internet Service Provider (ISP) for Internet access, while the other channel is connected to a "private" intranet. The modem 10 includes a router 18 which communicates over connection 20 and with LAN interface 12. Devices on LAN 22 send packets to one of the ISDN channels by sending a packet addressed to the modem 10 with the desired destination IP address and message content contained with the packet. The router 18 forwards

the message on one of the ISDN channels to the desired IP address. In the reverse direction, router receives packets from lines 20 and determines the desired destination on LAN 22, and forwards the packets via interface 12 on LAN 22 with the correct desired destination address. In the preferred embodiment in which one channel is used for the intranet and the other for the Internet, router 18 also switches packets received from the LAN 22 base on the desired address either to the Internet channel or the intranet channel. Of course, both channels could be used for intranet or Internet purposes, or even for connecting to a different type of data network.

Modem 10 includes in the preferred embodiment a DNS relay module 19, and DHCP Server 16 in modem 10 configures Stations on LAN 22 with LAN interface 12 ip address as their DNS. From the stations point of view, DNS Relay Module 19 becomes the DNS. Thus, in accordance with TCP\IP, when an address is requested by domain name, instead of using a numeric IP address, the device sends a request to the DNS for the numeric IP address for the domain name. The DNS relay module 19 is however not a full DNS. The advantage of identifying module 19 as a DNS is that certain frequently used domain names may be contained in module 19 and specific responses can be given immediately for those domain names, while remaining domain name requests can be passed on to a remote complete DNS, such as an ISP DNS. Furthermore, the domain name for an internal corporate domain name may be contained in module 19 and the intranet IP address immediately returned (instead of the Internet address). Of course, the subsequently requested IP address will be routed by router 18 on the intranet channel of ISDN connection 20.

The DNS relay module 19 can also contain two or more external DNS addresses. When a request for a domain name from one of the external servers fails (preferably only after two failures), the module 19 switches to using another one of the plurality of external DNS addresses. In this way, greater reliability and efficiency of accessing domain names from the LAN 22 is afforded. The stations

on the LAN 22 only need to know one DNS address while in fact they have actually the benefit of multiple DNS.

The DNS relay module 19 could also be used to keep a list of frequently used domain names, simply to increase access speed. The module 19 could also keep a list of forbidden domain names to which either no response is given or the address for a warning page is given. The module 19 could also keep a list of domain names requiring secure access, in which case the address for a secure gateway could be returned.

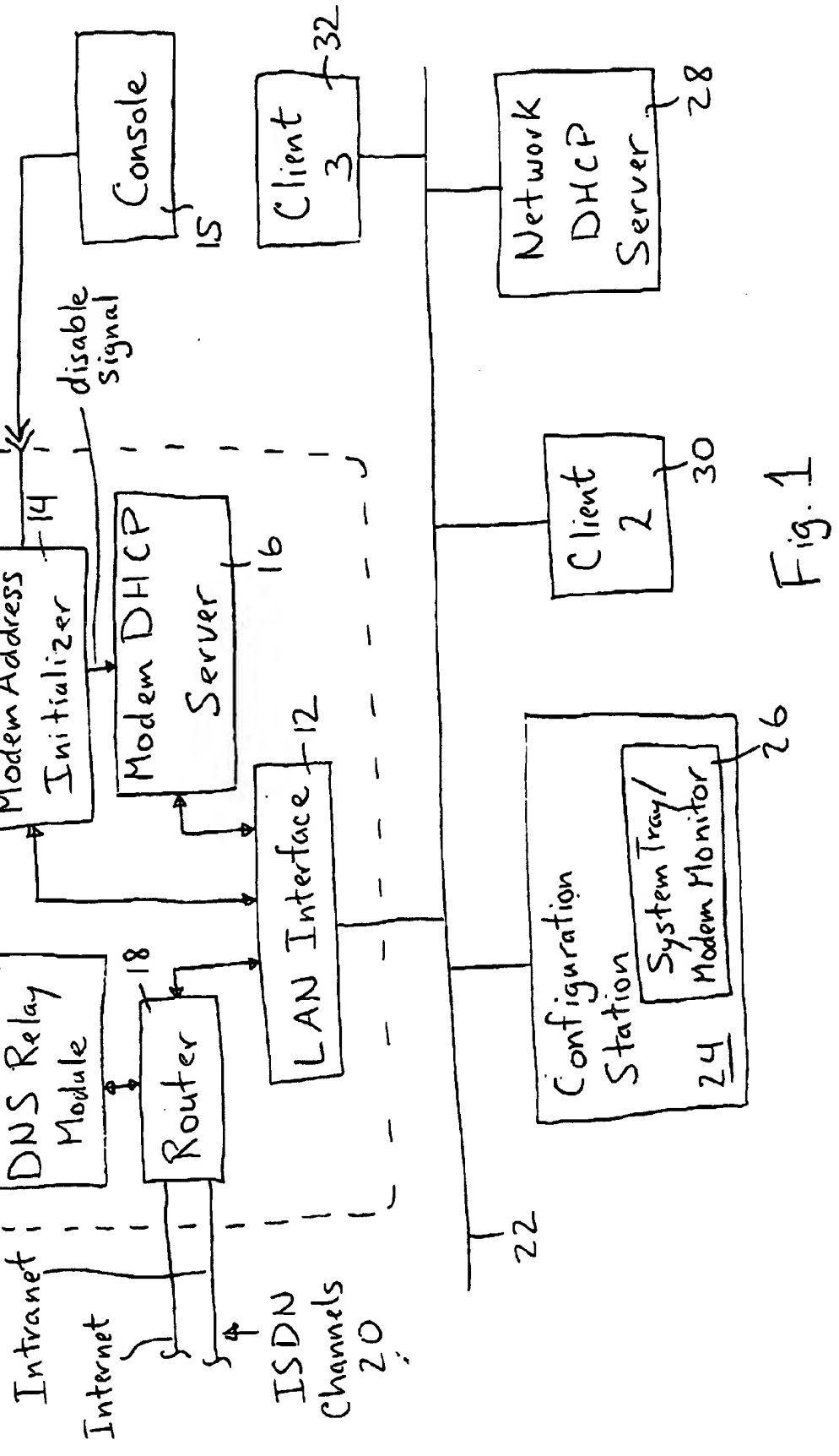
LAN ISDN Modem
10
Console
15
Client 3
32
Network DHCP Server
28
disable signal
Modem Address Initializer
14
Modem DHCP Server
16
Client 2
30
LAN Interface
12
DNS Relay Module
19
Router
18
Configuration Station
System Tray/ Modem Monitor
24
26
Intranet
Internet
ISDN Channels 20
22

Fig. 1